

New Unit Information



HD 6/16 ST H

1.211-...

HD 9/16 ST H

1.042-...

HD 13/12 ST H

1.212-...

The units HD 6/16 ST H, HD 9/16 ST H, HD 13/12 ST H are stationary cold-water high-pressure cleaners for wall-mounting or positioning on a floor stand.

They are intended for operation from a pipe system with one or more taps. The taps can only be used alternately, however.

The units are designed for professional use in workshops etc. and differ in their performance ranges.

The high-pressure unit can be switched on

- directly at the unit, or
- using the remote control at the system tap.

Drive

- Air-cooled electric motor (4-pole).

Pump (comparable to HDS middle class between 1996 and mid-2000)

- 3-piston axial high-pressure pump made of brass.
- Pistons in stainless steel with ceramic sleeves.
- Swash plate with tapered roller bearing.
- Pressure and suction valve made of stainless steel.
- Carbon fibre reinforced valve cages.
- Float tank made of stainless steel.
- Vibration damper.
- Hot water precompression pump.

Electrics

- Unit switch with rotary knob.
- Timer module (2 - 8 min).
- Control box prepared for remote release.
- 24-Volt control voltage.
- 2 pressure switches.

Cleaning agents

- Cleaning agent suction hose with strainer.
- Cleaning agent metering valve on the left side underneath the unit cover.
- Cleaning agent feed in high-pressure operation.

Pressure and flow control valve

- Adjustable using Servopress handgun.

Accessory kits

The high-pressure cleaner can be enhanced by:

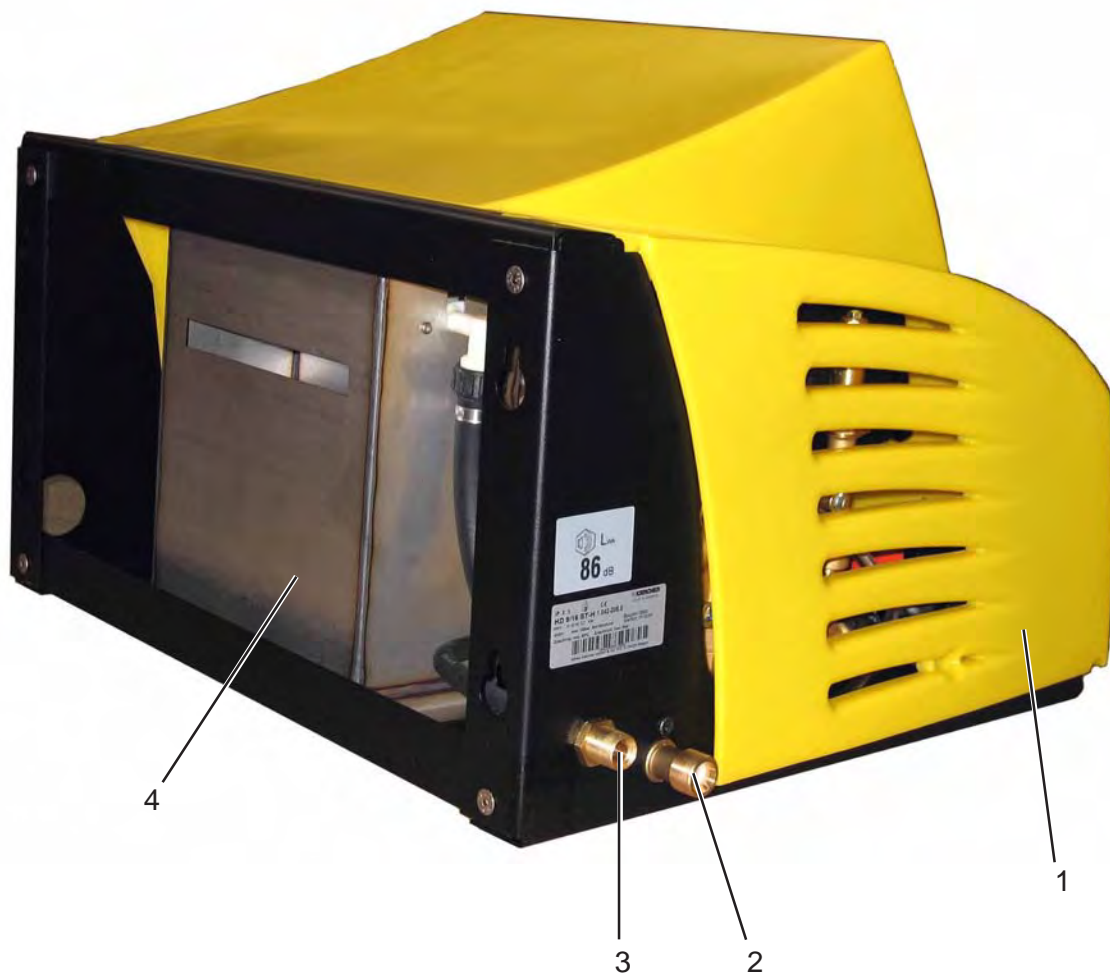
- Solenoid valve in water inlet.
- Changeover between two cleaning agents using solenoid valves in conjunction with a remote control.
- Cleaning agent level monitoring by means of float switch.
- Emergency stop switch.
- Wall bracket made of stainless steel.
- Floor stand optionally made of powder-coated steel or stainless steel.
- Unit cover made of stainless steel.

View from front



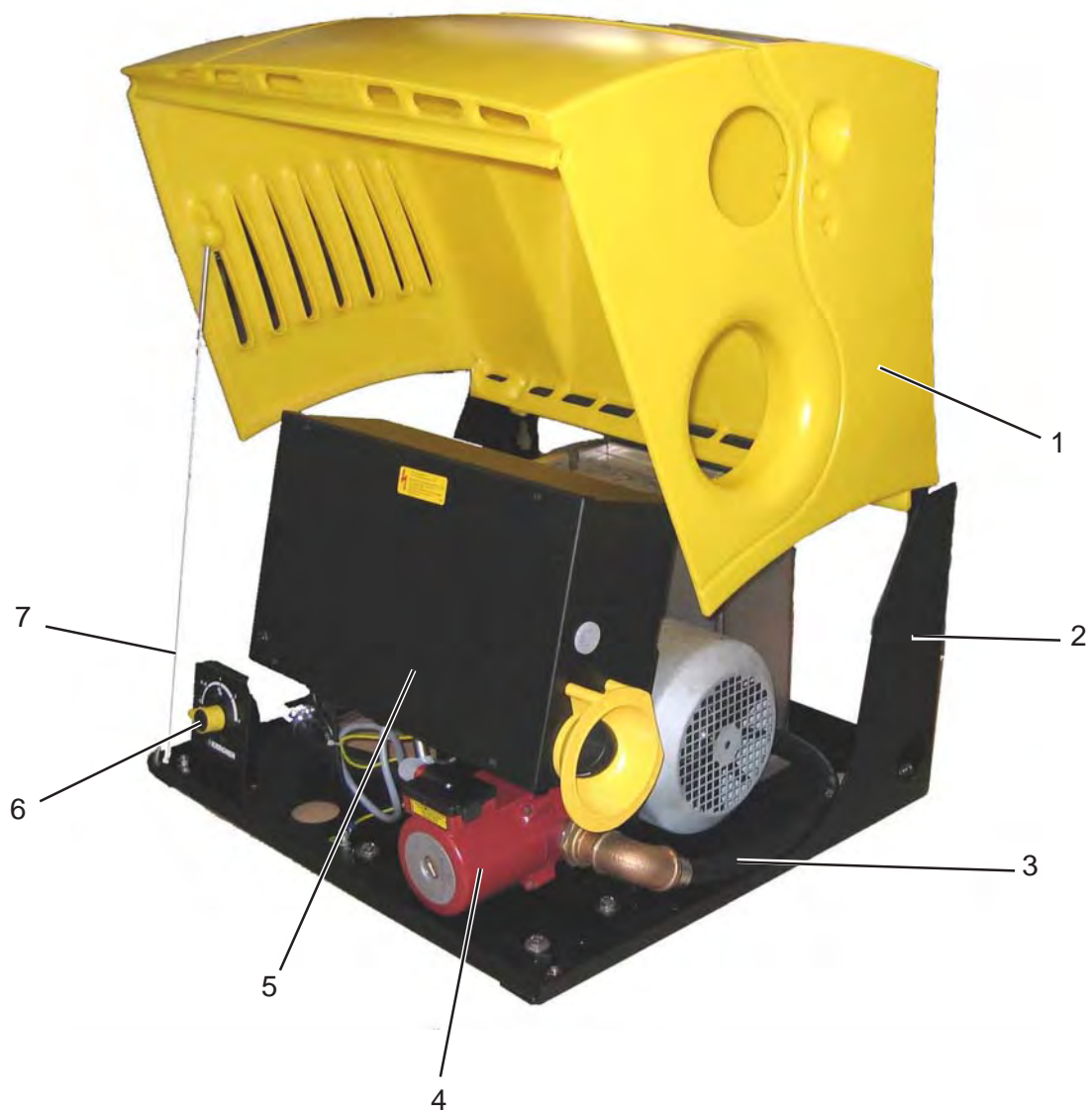
- 1 Frame
- 2 Ventilation, motor cooling
- 3 Unit switch
- 4 Unit cover

View from the back



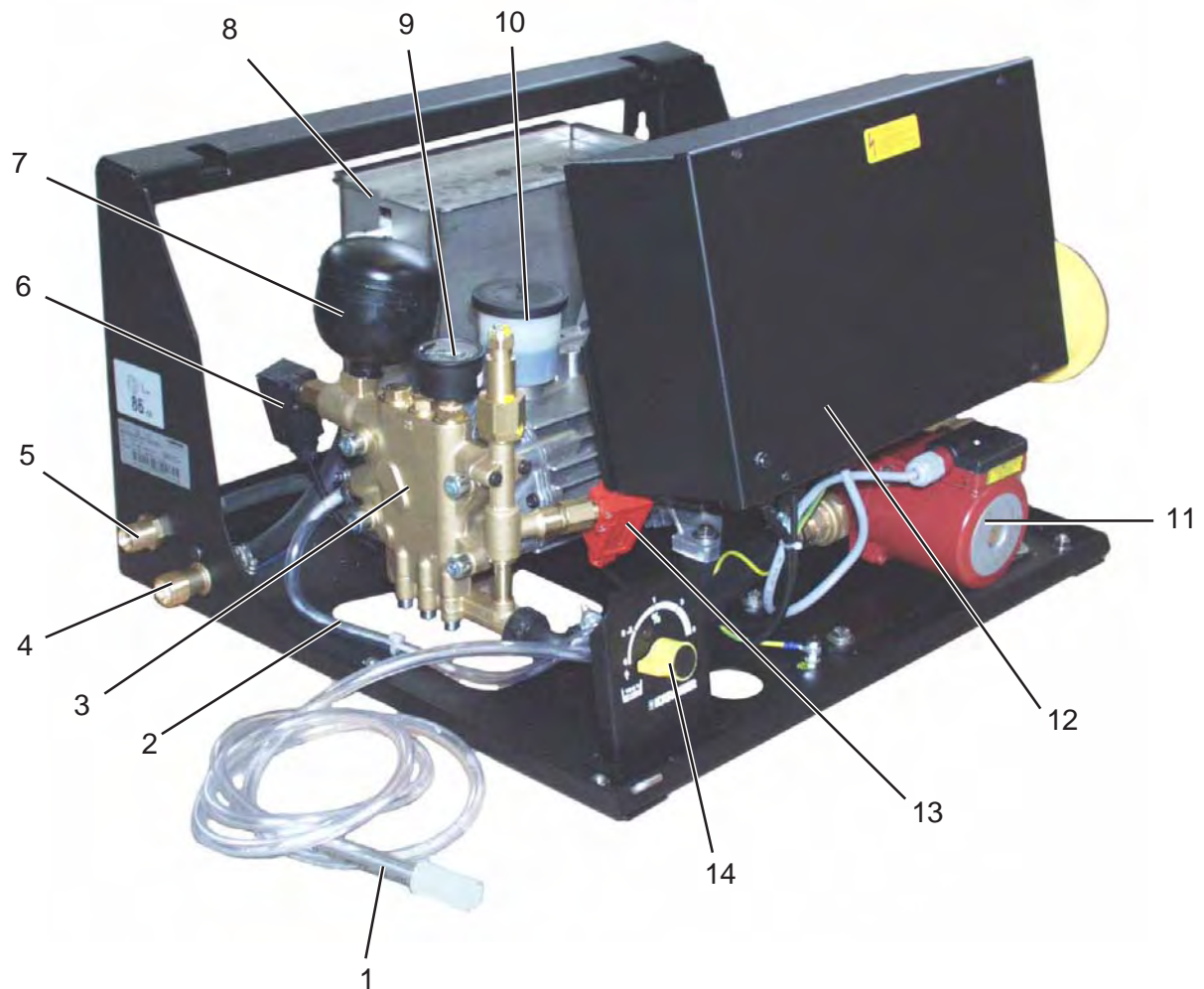
- 1 Unit cover
- 2 Water inlet with strainer
- 3 High-pressure outlet
- 4 Float tank

View from the right (unit cover folded up)



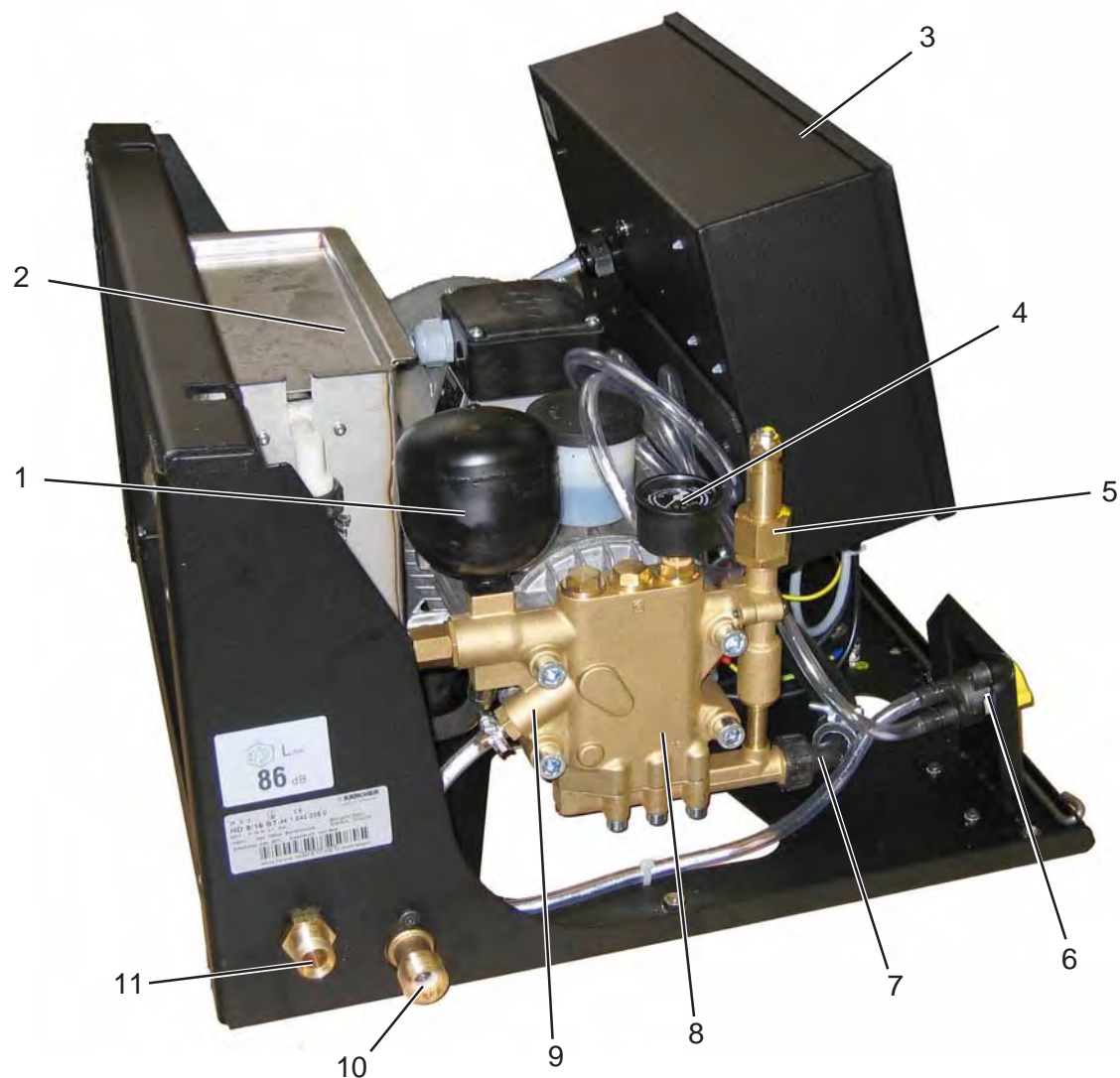
- 1 Unit cover, opened
- 2 Frame
- 3 Hose line from float tank to hot water precompression pump (4)
- 4 Hot water precompression pump
- 5 Control box
- 6 Metering valve, cleaning agent
- 7 Unit cover support rod

View from the left (unit cover removed)



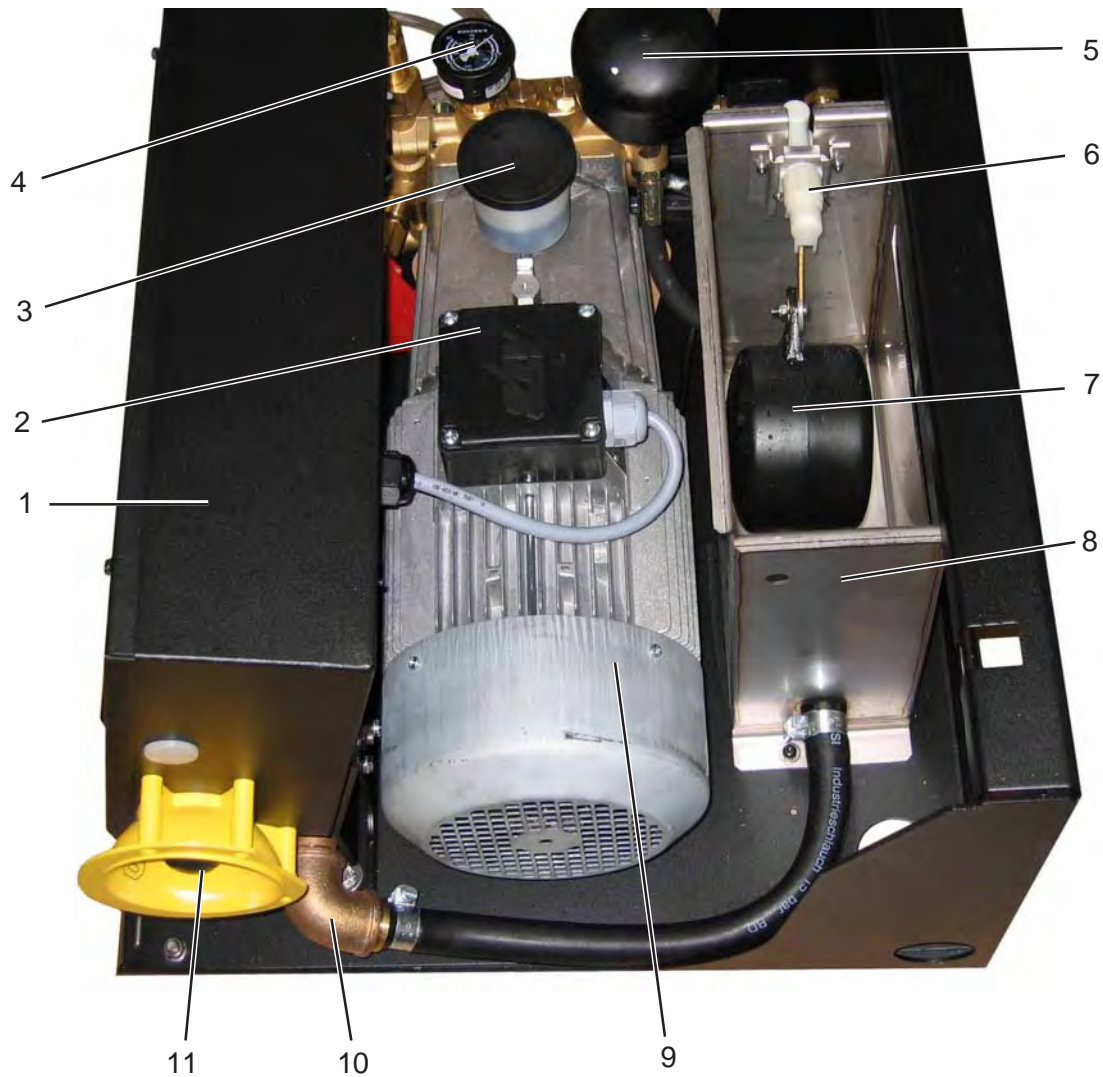
- 1 Cleaning agent, suction hose with strainer
- 2 Suction hose, cleaning agent from metering valve (14) to cylinder head
- 3 Cylinder head
- 4 Water inlet with strainer
- 5 High-pressure outlet
- 6 Pressure switch, ON
- 7 Vibration damper
- 8 Float tank
- 9 Pressure gauge
- 10 Oil reservoir
- 11 Hot water precompression pump
- 12 Control box
- 13 Pressure switch, OFF
- 14 Metering valve, cleaning agent

High-pressure pump, cylinder head



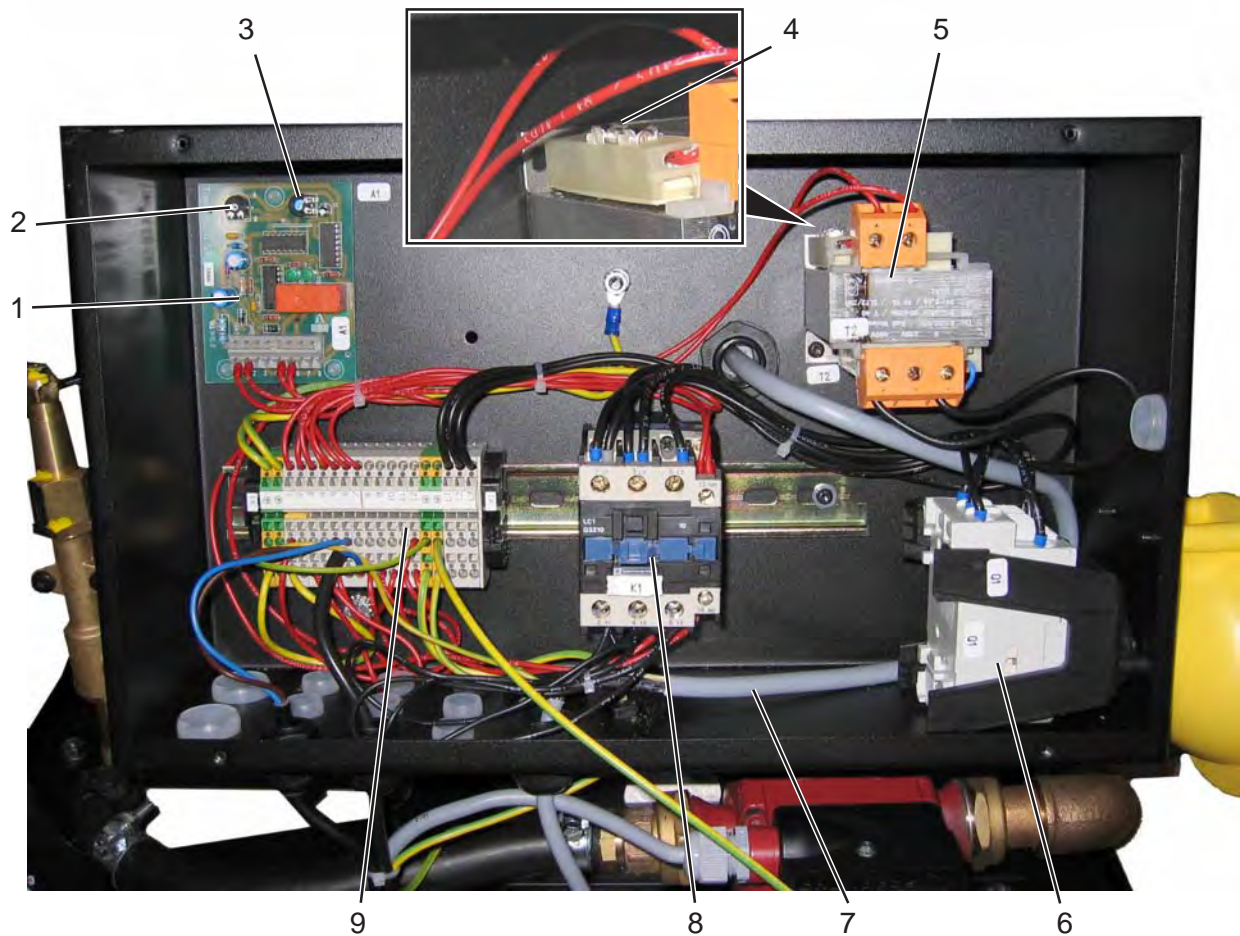
- 1 Vibration damper
- 2 Float tank
- 3 Control box
- 4 Pressure gauge
- 5 Overflow valve
- 6 Metering valve, cleaning agent
- 7 Water inlet, from the hot water precompression pump to the cylinder head (8)
- 8 Cylinder head
- 9 Cleaning agent connection with non-return valve
- 10 Water inlet with strainer
- 11 High-pressure outlet

View from above



- 1 Control box
- 2 Connection, electric motor
- 3 Oil reservoir
- 4 Pressure gauge
- 5 Vibration damper
- 6 Float valve
- 7 Float
- 8 Float tank
- 9 Electric motor
- 10 Hose line from float tank (8) to hot water precompression pump
- 11 Unit switch

Control box, cover removed

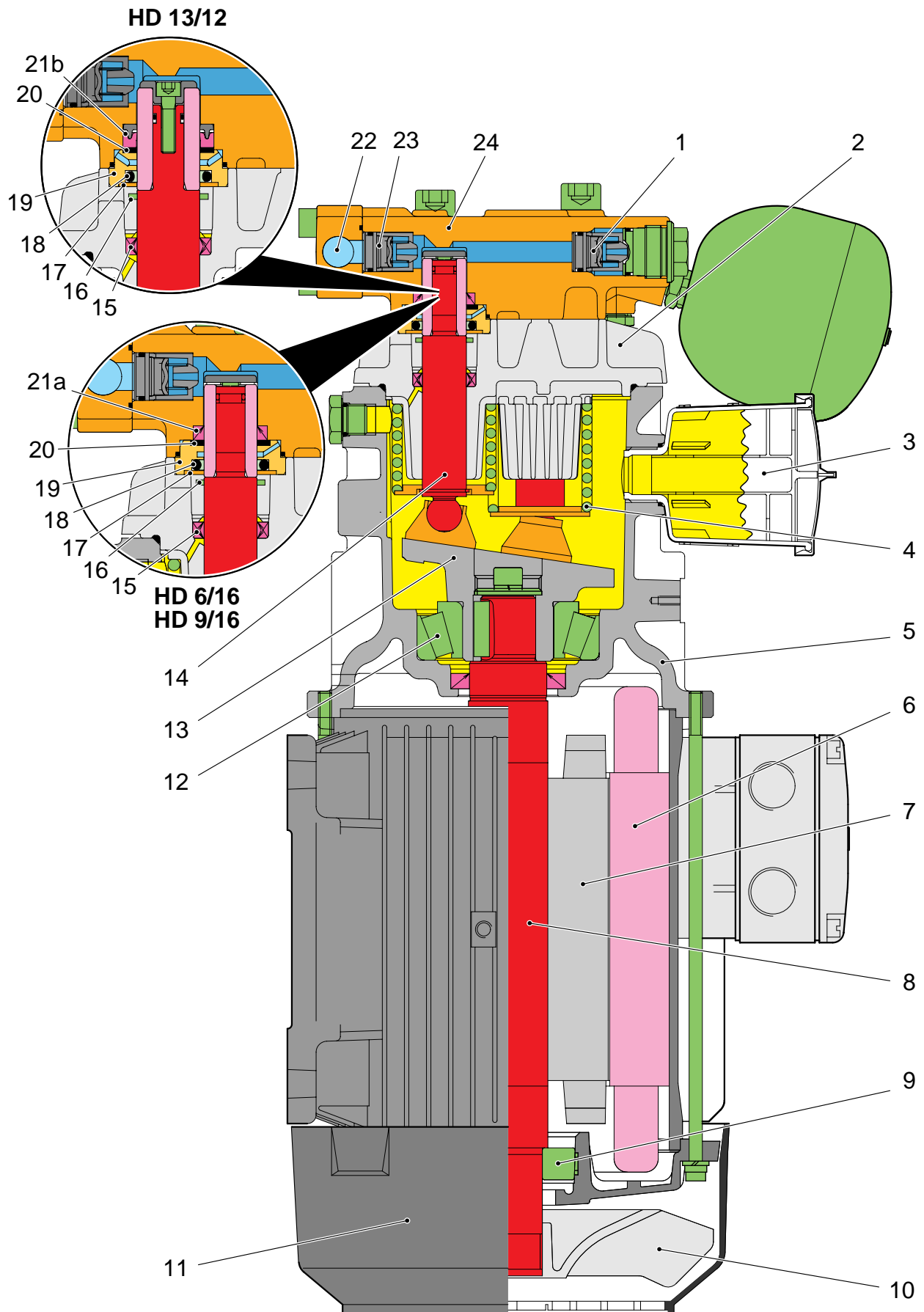


- 1 Printed circuit board (timer module)
- 2 Potentiometer, fine adjustment standby time (between 2 and 8 minutes)
- 3 Potentiometer, rough adjustment of standby time (sealed)
- 4 Fuse (F2)
- 5 Control circuit transformer (T2)
- 6 Unit switch (Q1)
- 7 Connection cable, power supply
- 8 Power contactor (K1)
- 9 terminal strip

Note:

The rough adjustment potentiometer (3) on the main control printed circuit board is pre-set in the factory and must not be changed.

Functional characteristics: Motor and high-pressure pump



Functional characteristics: Motor and high-pressure pump

- 1 Pressure valve (3x)
- 2 Piston housing
- 3 Oil tank
- 4 Piston spring
- 5 Motor housing
- 6 Motor winding (stator)
- 7 Motor winding (rotor)
- 8 Drive shaft, motor
- 9 Motor bearing, rear
- 10 Impeller fan
- 11 Impeller fan cover
- 12 Motor bearing, front
- 13 Swash plate
- 14 Piston (3x)
- 15 Oil seal (3x)
- 16 Wiping ring
- 17 Washer (3x)
- 18 Low-pressure seal (3x)
- 19 Bushing (3x)
- 20 Washer (3x)
- 21 **a** High-pressure seal (3x)
(for HD 6/16 and HD 9/16)
- 21 **b** High-pressure seal with support
ring (3x) (for HD 13/12)
- 22 Water inlet
- 23 Suction valve (3x)
- 24 Cylinder head

High-pressure pump

The high-pressure pump is a 3-piston swash-plate pump with drive running in oil bath.

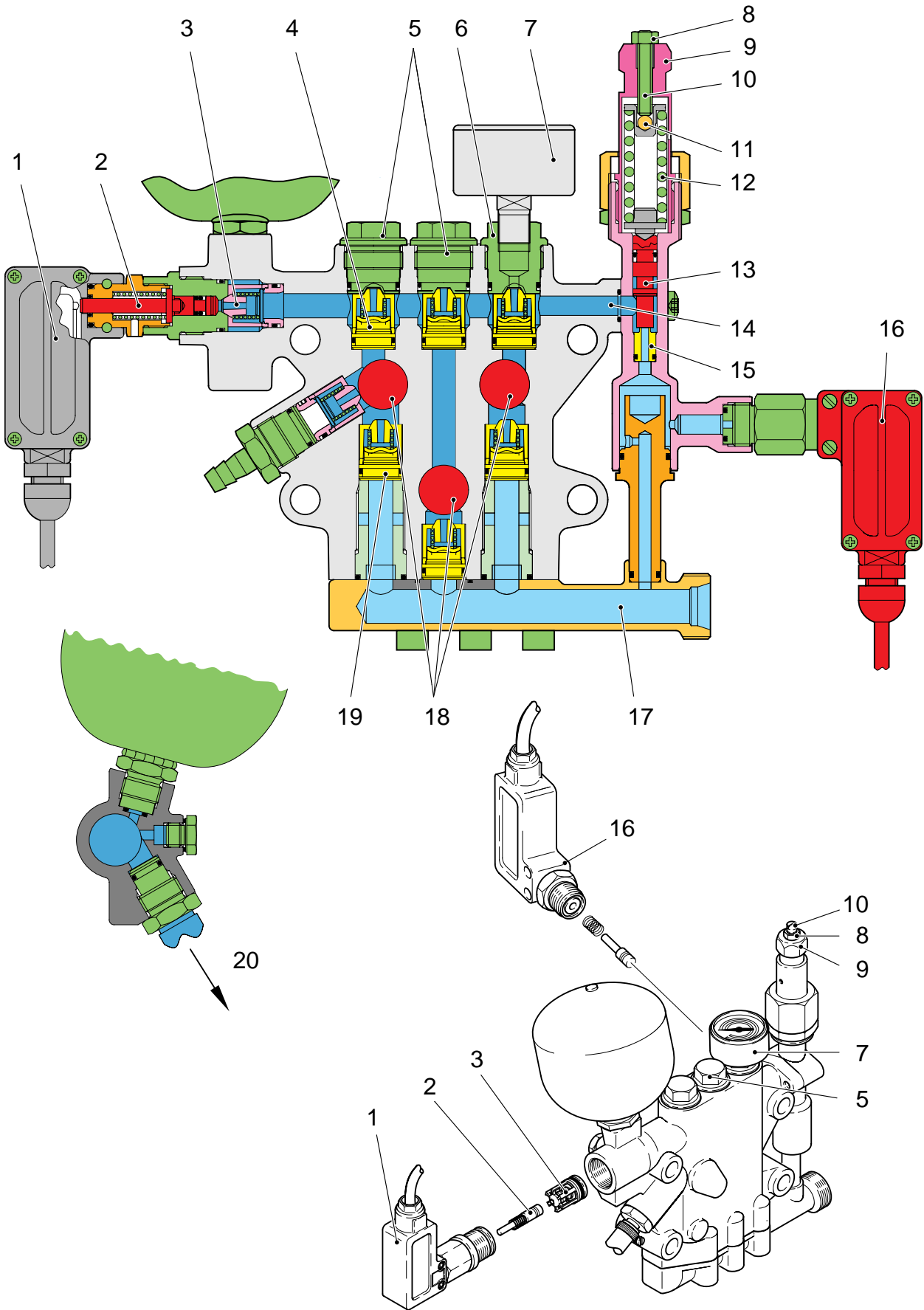
It is attached directly to the drive shaft (8) and therefore has a correspondingly high rate of efficiency.

- When the piston (14) is pulled back, water is drawn in through the open suction valve (23).
- When the piston (14) is pushed forward, the suction valve (23) closes and water is conveyed through the open pressure valve (1) to the high-pressure line.

Motor

The motor is an electric motor (4-pole) and air-cooled by the impeller fan (10).

Functional characteristics: Pump



Functional characteristics: Pump

- 1 Pressure switch, ON
- 2 Contact spindle
- 3 Non-return valve
- 4 Pressure valve (3x)
- 5 Screw plug
- 6 Screw plug with pressure gauge
- 7 Pressure gauge
- 8 Lock nut
- 9 Pressure screw
- 10 Threaded stud
- 11 Ball
- 12 Spring
- 13 Overflow piston
- 14 Connection bore to overflow valve
- 15 Overflow seat
- 16 Pressure switch, OFF
- 17 Suction chamber
- 18 Pump piston
- 19 Suction valve (3x)
- 20 High-pressure outlet

Servopress handgun open

When the Servopress handgun is fully open, water flows from the pressure chamber through the pressure valve (4) to the high-pressure outlet (20). The overflow piston (13) of the overflow valve is pressed downwards by the spring (12) thereby sealing the connection bore (14) from the pressure chamber to the suction chamber.

Servopress handgun partly closed

When the Servopress handgun is partly closed, the pressure in the pressure chamber will keep increasing slightly. This ensures that the overflow piston (13) is pressed slightly upwards against the spring pressure (spring, 12) so that part of the delivery volume flows to the suction chamber (17).

Servopress handgun completely closed

When the Servopress handgun is closed, the pressure in the pressure chamber increases abruptly. This peak pressure acts upon the overflow piston (13) via the connection bore (14) and presses the piston completely upwards so that the complete delivery volume flows to the suction chamber (17) via the connection bore (14). As soon as the Servopress handgun is closed, the non-return valve (3) closes. This ensures that the total system pressure is enclosed between the Servopress handgun and the non-return valve (3).

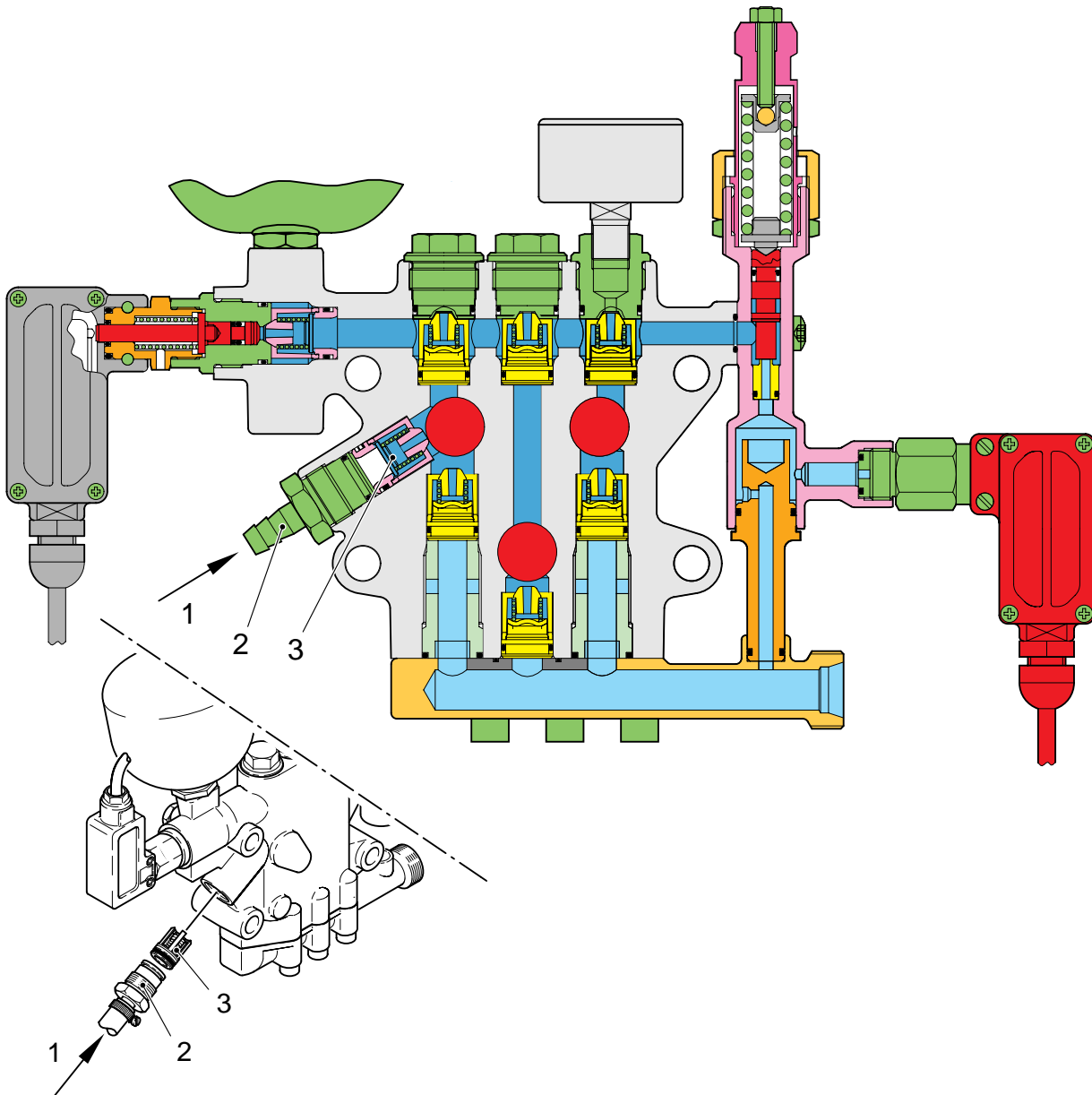
In this position, the pressure switch (16) is actuated. The electrical circuit is interrupted and the motor switched off.

Servopress handgun opened

When the Servopress handgun is reopened, the pressure in the system drops abruptly.

The contact spindle (2) is pressed back into the original position by its own spring. The pressure switch (1) will close the electrical circuit, and the motor will be switched back on.

Functional characteristics: Operation cleaning agent



- 1 Cleaning agent supply
- 2 Connecting nipple for cleaning agent suction hose
- 3 Cleaning agent non-return valve

Suction principle

With this system, the detergent is solely taken in by one piston in the pump, as soon as the metering valve is opened.

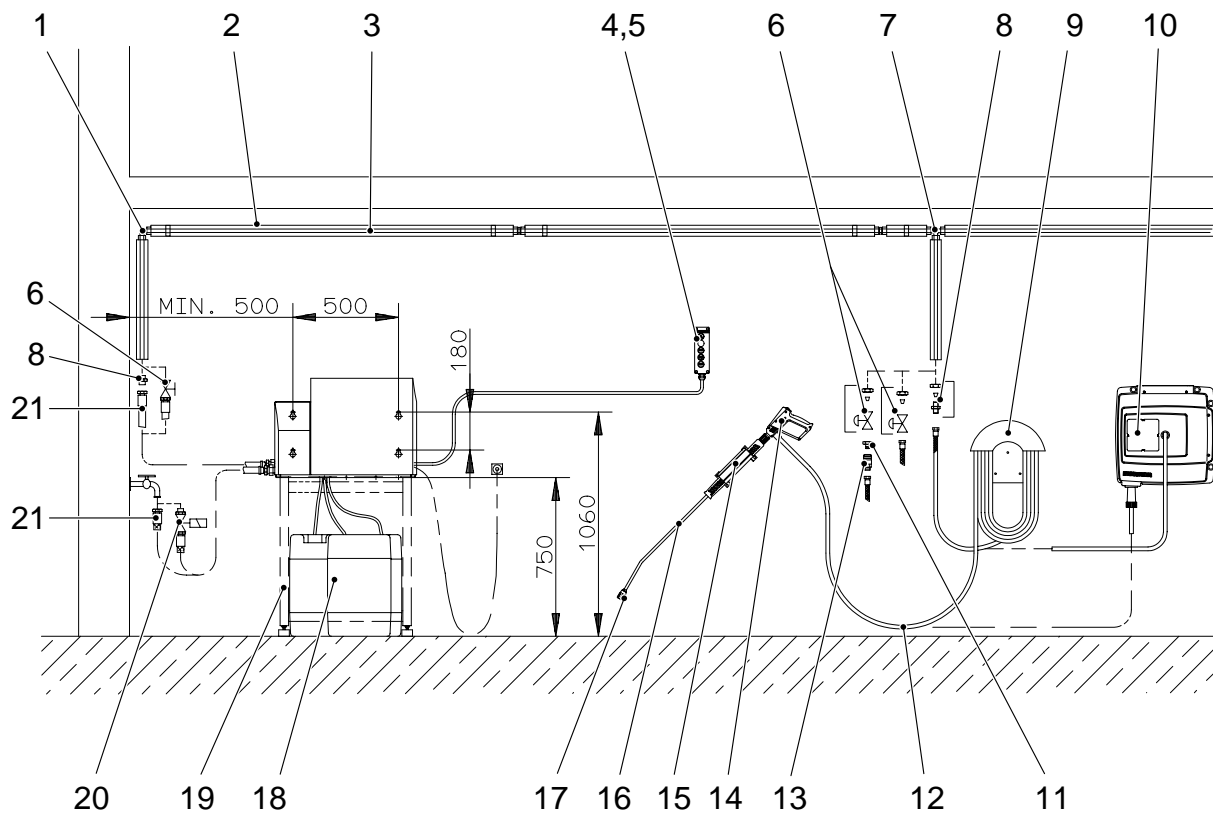
Metering valve

The input to the metering valve at the unit is connected to the detergent reservoir. The output is connected by a hose to the connecting nipple (2) on the cylinder head. The amount of detergent fed into the system can be continuously adjusted by turning the rotary knob.

Non-return valve

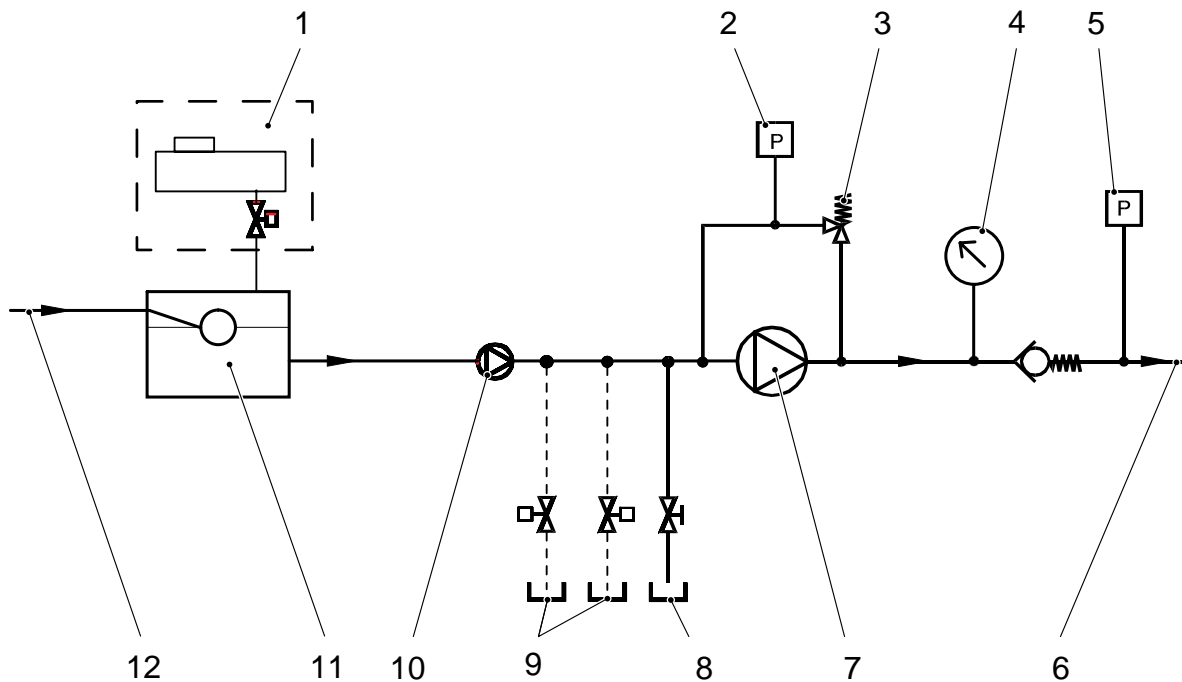
The non-return valve (3) opens to allow the detergent to flow as soon as the metering valve has been opened. When the metering valve is closed, the non-return valve (3) is also closed in order to prevent water from flowing through the detergent suction hose into the detergent reservoir.

Suggested installation – fixed pipeline network



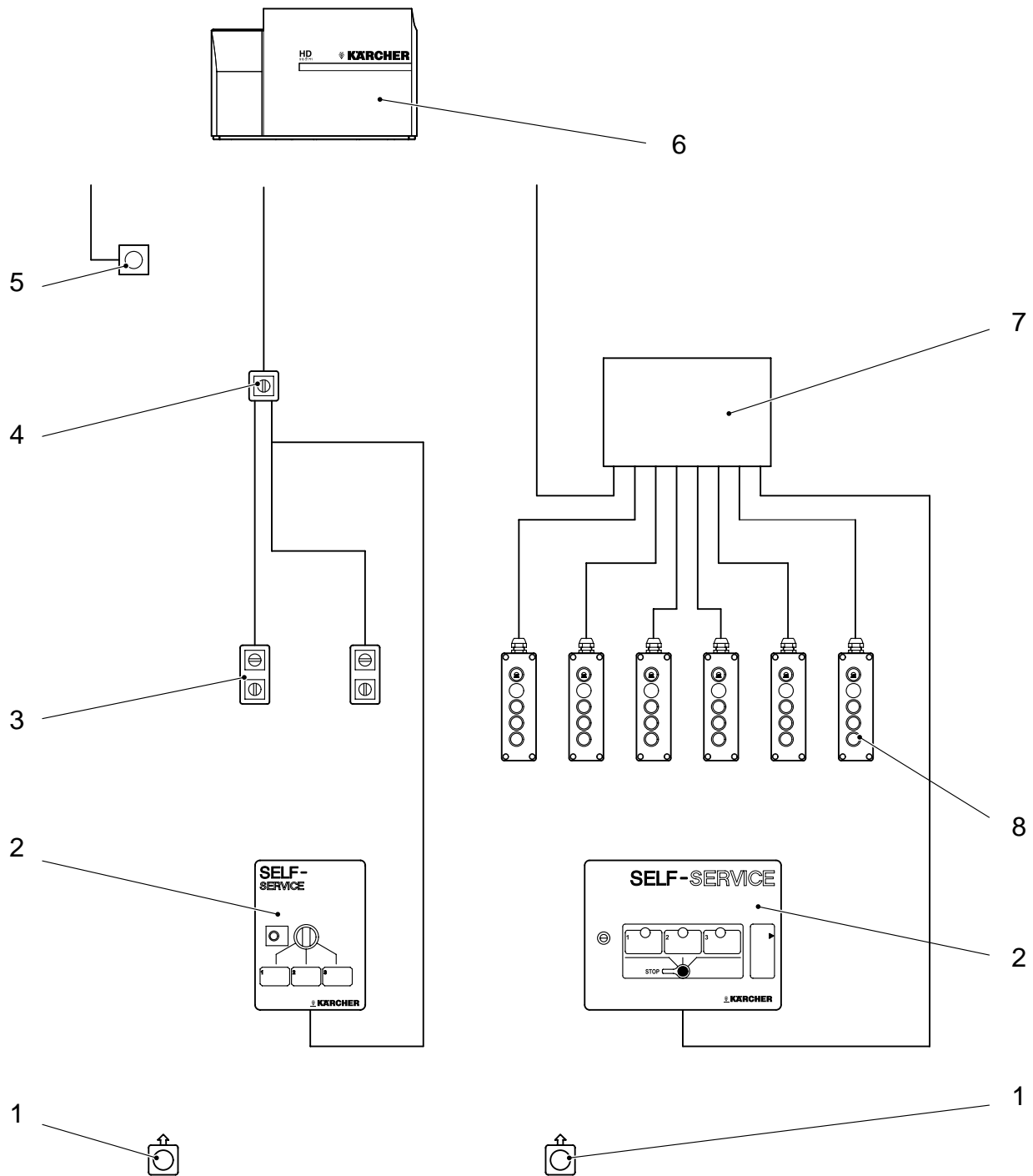
- | | |
|--|----------------------------------|
| 1 Elbow coupling | 13 Quick-coupler, plug connector |
| 2 Thermal insulation | 14 Handgun |
| 3 Pipeline set | 15 Spray lance holder |
| 4 Remote control | 16 Spray lance |
| 5 EMERGENCY-STOP switch for attachment to wall | 17 Nozzle connection |
| 6 Shut-off tap NW 8 | 18 Cleaning agent tank, 60 litre |
| 7 T-threaded connection | 19 Base frame |
| 8 Connection nipple, brass | 20 Solenoid valve, water inlet |
| 9 Hose holder | 21 Water hose |
| 10 Hose reel | |
| 11 Quick-coupler, fastened part | |
| 12 HP hose 10 m | |

Flow chart



- 1 Accessory kit – scale inhibitor (option)
- 2 Pressure switch OFF
- 3 Overflow valve
- 4 Pressure gauge
- 5 Pressure switch ON
- 6 High-pressure outlet
- 7 High-pressure pump
- 8 Cleaning agent metering manually
- 9 Mounting kit, 2 cleaning agents (optional, with remote control only)
- 10 Precompression pump, hot water
- 11 Float tank
- 12 Water inlet

Installation – Remote control (optional)



- 1 Coin-acceptor unit
- 2 Coin remote control
- 3 Remote control, ON / OFF
- 4 Priority switch
- 5 EMERGENCY-STOP switch
- 6 Unit HD-ST-H
- 7 Distributor, remote controls
- 8 Remote controls: ON / OFF, RM 1 / RM 2, optional / EMERGENCY-STOP

Troubleshooting

Fault	Remedy
Unit not running	<ul style="list-style-type: none"> - Check / replace mains voltage, connection cable and mains fuse. - Check / replace unit switch, power contactor and control circuit transformer. - Check / replace both pressure switches. - Check / replace motor.
Unit does not come up to pressure	<ul style="list-style-type: none"> - Check / increase water inlet volume. - Clean / replace strainer in water inlet. - Vent unit. - Check / replace high-pressure nozzle. - Check pressure and suction valves for leaks / replace. - Check overflow valve for leaks / adjust / replace. - Check / replace high and low pressure seals.
Unit switches on and off continuously with handgun closed	<ul style="list-style-type: none"> - Check all connections between the hand gun and the pump outlet for leaks / replace. - Check / replace non-return valve. - Check / replace cleaning agent non-return valve.
Unit does not shut off when closing the handgun	<ul style="list-style-type: none"> - Check / replace non-return valve. - Check / replace both pressure switches. - Check throttle bore in return sleeve of the overflow valve / replace return sleeve.
Cleaning agent is not drawn in	<ul style="list-style-type: none"> - Clean / replace cleaning agent strainer. - Check / clean / replace cleaning agent non-return valve. - Check / replace metering valve.
Water escaping between cylinder head and piston housing	<p>Leakage of 1 drop per minute per piston are admissible.</p> <ul style="list-style-type: none"> - Check / replace high- and low-pressure seal.
Oil escaping between cylinder head and piston housing	<ul style="list-style-type: none"> - Check / replace oil seal at piston.

Technical specification

Special tools

Multimeter	6.803-022
Test pressure gauge	4.742-025
Shut-off valve	4.580-034
Adapter System 2000	4.401-072
Disassembly pliers, pressure and suction valves	4.901-062
Mounting mandrel with sleeve, high-pressure/oil seal (Ø 20 mm)	2.901-015
Mounting mandrel with sleeve, high-pressure/oil seal (Ø 22 mm)	2.901-037
Mounting mandrel, O-ring/support ring, overflow piston	5.901-127
Assembly tool, overflow valve seat	4.901-126
Disassembly tool, overflow valve seat	4.901-125
Mounting screws (2x, M6 x 110), piston guide housing	7.304-467
Extraction tool, swash plate	4.901-038

Tightening torque levels

Fastening screw, cylinder head	50 - 60 Nm
Fastening screw, piston housing	1 - 3 Nm
Fastening screw, swash plate	20 Nm
Screw plug, suction valve cover	20 Nm
Screw plug, pressure valve	45 - 50 Nm
Oil drain plug	20 - 25 Nm

Technical specification

unit type	unit no.	circuit diagram	operating instruction	maintanance booklet	spare parts list
HD 6/16 ST H *EU I 400 V / 3~ / 50-60 Hz	1.211-205	0.088-525	5.960-490	5.950-582	5.958-979
HD 6/16 ST H *EU II 230 V / 3~ / 50-60 Hz	1.211-206	0.088-526	5.960-490	5.950-582	5.958-979
HD 9/16 ST H *EU I 400 V / 3~ / 50-60 Hz	1.042-205	0.088-525	5.960-490	5.950-582	5.958-971
HD 9/16 ST H *EU II 230 V / 3~ / 50-60 Hz	1.042-206	0.088-526	5.960-490	5.950-582	5.958-971
HD 13/12 ST H *EU I 400 V / 3~ / 50-60 Hz	1.212-205	0.088-525	5.960-490	5.950-582	5.958-980
HD 13/12 ST H *EU II 230 V / 3~ / 50-60 Hz	1.212-206	0.088-526	5.960-490	5.950-582	5.958-980

The technical specification sheets and circuit diagrams are on the next edition of the spare parts CD-ROM (DISIS) and in the Intranet.

Technical specification sheet: folder "Central / Service Info Int'l / Technical Specifications"

circuit diagram: folder "Central / Service Info Int'l / Circuit Diagram"

Further operating instructions and spare parts lists as paper documents can be ordered with the corresponding part number from our Spare Parts Department.